

## Listing of Claims

20 (canceled).

21 (currently amended): ~~The method of claim 20, wherein~~ A method for location determination of mobile cell phones utilizing a plurality of base stations comprising the steps of:

- a. transmitting a positioning request signal from a base station to a specified mobile cell phone;
- b. receiving at each of said plurality of base stations a positioning response signal from said specified mobile cell phone to said base stations;
- c. calculating at each of said plurality of base stations, a time delay value representing the time interval between transmission of a parcel of data from said mobile cell phone to said base stations, using a location device within each of said plurality of base stations,
- d. transmitting said time delay values to a location database server; and
- e. estimating the position of the mobile cell phone from data received at said location database server from each of said plurality of base stations;

wherein the step of estimating the position of the mobile cell phone from data received at said location database server from each of said plurality of base stations employs a redundancy algorithm chosen to be consistent with the number of said plurality of base stations used for determining the mobile cell phone position, and ~~further~~ comprises the steps of:

- i. compiling location information from each location device within each base station;
- ii. using said location information as input data to a calculation based on a wireless 3D hyperbolic model;
- iii. using said redundancy algorithm to calculate the estimated position of

the mobile cell phone.

whereby a determination of the location of the mobile cell phone is generated.

22 (currently amended): The method of claim 21, ~~wherein~~ wherein the number of base stations is two, and the redundancy algorithm comprises the steps of:

- a. identifying two rays, one from each base station, derived from angle-of-arrival of signal;
- b. identifying two circular lines, one from each base station, calculated from attenuation of signal;
- c. deriving a set of points based on the intersections of the rays and circular lines so ~~identified~~ identified;
- d. calculating an intermediate location estimator by averaging the points so derived;
- e. identifying the closest endpoint as the intersection of the two circular lines that is closest to the intermediate location estimator; and
- f. calculating a final location estimator by averaging the intermediate location estimator with the closest endpoint.

23 (currently amended): The method of claim 21, ~~wherein~~ wherein the number of base stations is three, and the redundancy algorithm comprises the steps of:

- a. identifying three rays, one from each base station, derived from angle-of-arrival of signal;
- b. deriving a set of three points at the intersection of the rays so identified;
- c. calculating a first intermediate location estimator based on the set of points so derived;
- d. identifying three circular lines, one from each base station calculated from attenuation of signal;
- e. deriving a set of four points from the intersection of the three circular lines;
- f. calculating a second intermediate location estimator from the set of

- four points so derived; and
- g. calculating a final location estimator using a weighted average of the first and second location estimators.

24 (currently amended): The method of claim 21, ~~wherein~~ wherein the number of base stations is four, and the redundancy algorithm comprises the steps of:

- a. receiving at each base station, a location signal using a BTS dual vibration antenna at each base station;
- b. measuring the time difference of arrival of the location signal among the four base stations; and
- c. transmitting the time difference of arrival as input data to the location database server;

whereby the location database server computes the three-dimensional location of the mobile cell phone based on the input data.

25 (currently amended): The method of claim 24, ~~wherein~~ wherein the mobile cell phone is substantially equidistant from all four base stations, ~~wherein~~ wherein the step of estimating the position of the mobile cell phone further comprises the step of performing an equirange configuration calculation.

26 (canceled).

27 (canceled).

28 (currently amended): ~~The system of claim 27, A system for location determination of mobile cell phones utilizing a plurality of base stations comprising:~~

- a. first transmission means for transmitting a positioning request signal from a base station to a specified mobile cell phone;
- b. receiving means for receiving a positioning response signal from said specified mobile cell phone to said base stations;

- c. calculating means for calculating at each of said plurality of base stations, a time delay value representing the time interval between transmission of a parcel of data from said mobile cell phone to said base stations, using a location device within each of said plurality of base stations;
- d. second transmission means for transmitting said time delay values to a location database server; and
- e. estimation means for deriving the position of the mobile cell phone from data received at said location database server from each of said plurality of base stations;

wherein said estimation means comprises a location device, a plurality of correlators within each said location device, a plurality of threshold devices, each said correlator having its output fed to the input of a respective threshold device, the output of each said threshold device and the output of time slot window frames being input to a timing block, the output of said timing block being fed to a microprocessor, and a computer-readable medium containing instructions for execution by said microprocessor to calculate an estimated mobile cell phone position.

29. (currently amended): The system of claim 28, ~~wherein~~ wherein the timing block comprises a plurality of logic-multiplier devices forming a conditioning circuit, said circuit receiving digital signals from output of at least one of said correlator, said circuit outputting pulses to the input of a counter module, whereby the counter module counts the number of pulses received during a predetermined duration, said number of pulses being used as an input to a microprocessor which performs calculations to compute a timing signal.

30. (currently amended): The system of claim 28, ~~wherein~~ wherein the location device comprises a first receiver and first antenna and a second receiver and second antenna, the distance between the antennas being known, output of said second receiver being fed to a CDMA correlator, output of said CDMA correlator

being fed to a timing block, whereby the timing block derives a time-difference-of-arrival timing signal.

31. (currently amended): The system of claim 30, ~~wherein~~ wherein the output of the first and second receivers are fed to a phase meter, whereby the phase meter measures the differences between signals in the first antenna and second antenna.

32. (currently amended): The system of claim 31, wherein an assembly generating an input to the phase meter comprises :

- a. a first logic circuit;
- b. a second logic circuit; and
- c. an oscillator operating at  $36.10^n$  Hz, where n is an integer;

wherein output of said oscillator is fed into a divider, and also fed into said second logic circuit; output of said second logic circuit is fed into said first logic circuit; output of said first logic circuit is fed into a ~~counter~~; output counter; output of said counter is fed into a descrambler; ~~and~~ output and output of said descrambler is transmitted to the location database server; whereby the location data base server performs further processing to estimate the location of the specified mobile cell phone.